

Buried and submerged forests: keys to the history and impacts of postglacial volcanism and earthquakes on the landscape of the Puget Lowland—A review of geologic literature and recent discoveries

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Buried and submerged forests provide valuable clues to the history and impacts of postglacial volcanism and fault movements on the landscape of the Puget Lowland. Volcanic disturbances buried extensive landscapes including mature, old-growth forests and destroyed and/or severely disrupted pre-Euro-American-settlement human communities. Lahars (volcanic debris flows) and laharic flooding severely and repeatedly aggraded the Nisqually, Puyallup, White, Skagit, Duwamish, Stilliquamish, and Nooksack Rivers and caused delta progradation that dramatically altered the coastline of the Puget Lowland (Pringle and Scott, 2001; Zehfuss, 2003). Extremely large volcanic events triggered stream piracy in the Stillaguamish/Skagit River, Fraser/Nooksack, and White/Puyallup River systems (Fig. 1).

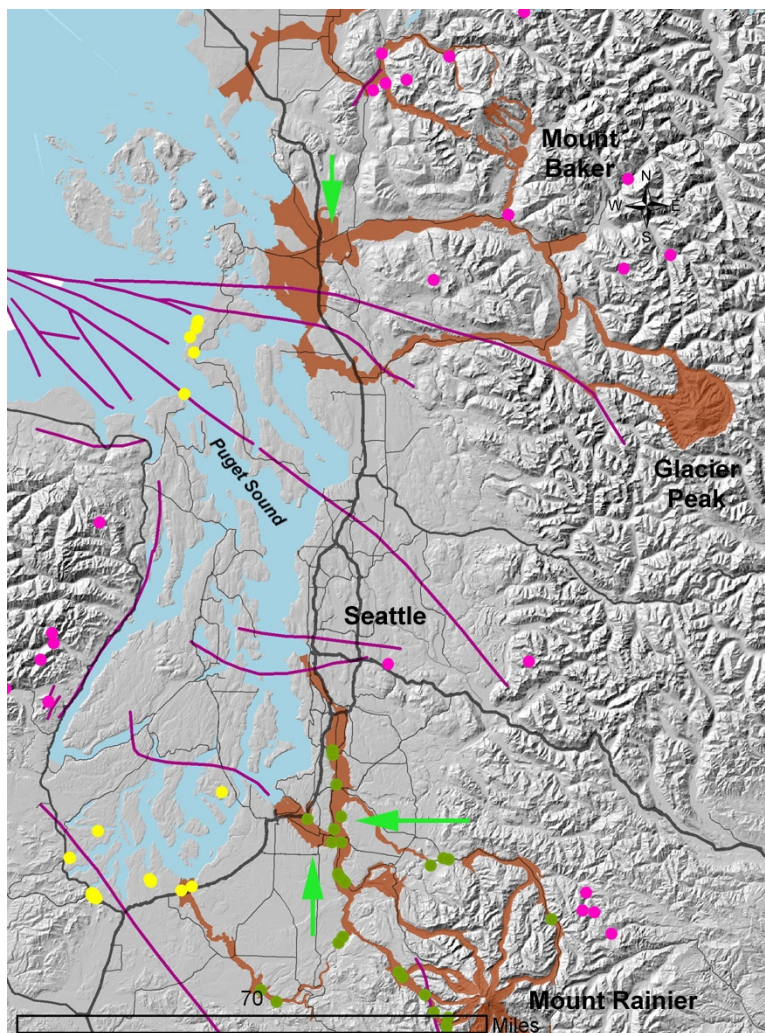


Figure 1. Shaded relief image (30 m DEM) showing approximate locations of Holocene lahar inundation areas based on US Geological Survey reports noted in text. Small green arrows show locations of shorelines about 5,500 yr ago in Puyallup, Duwamish, and Skagit River valleys, as interpreted by Luzier (1969) and Dragovich and others (1994; 2000). Green dots show locations of buried trees downstream of Mount Rainier, yellow dots show areas of

submerged forests in Puget Sound, and fuschia-colored dots show locations of submerged forests in landslide-dammed lakes. Lavendar lines show approximate locations of fault zones in the shallow crust.

Studies of submerged forests in south Puget Sound (Sherrod, 2001) and in areas of northern Puget Sound by various researchers suggest multiple episodes of abrupt local tectonic subsidence related to shallow crustal faults (Blakely et al, 2002; Kelsey et al, 2004; Johnson et al, 1999; 2001). Dendrochronology studies of these subfossil forests can greatly improve our understanding of the character, magnitude, and frequency of the associated landscape disturbances. This emerging history of past volcanism and tectonism and the inevitability of future eruptions and earthquakes, have profound implications for landscape change in the Puget Lowland and a wide spectrum of environmental-, and hazards-related concerns that relate to aquifers, ecologic systems (including human), seismicity, land use, and future risk.

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